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(54) **Method and apparatus for preventing unauthorised recording of source material (e.g. a gramophone recording)**

(57) A system for preventing unauthorised recording of source material comprises putting onto a source signal, for example a gramophone recording, a coded signal and including in a tape recorder a detector circuit to mar or inhibit recording only of that source signal, the coded signal being such that it does not significantly detract from the source material quality when played through normal equipment. A detector 8 is activated by the coded signal on attempted recording (and/or on replay) and may inhibit an amplifier 5 or activate a spoiler oscillator 10 which adds a spoiling signal to the input through a mixer 6. The coded signal may be a discrete signal comprising a burst of fixed frequency and may be recorded in digital form (e.g., as an 8 bis code word).

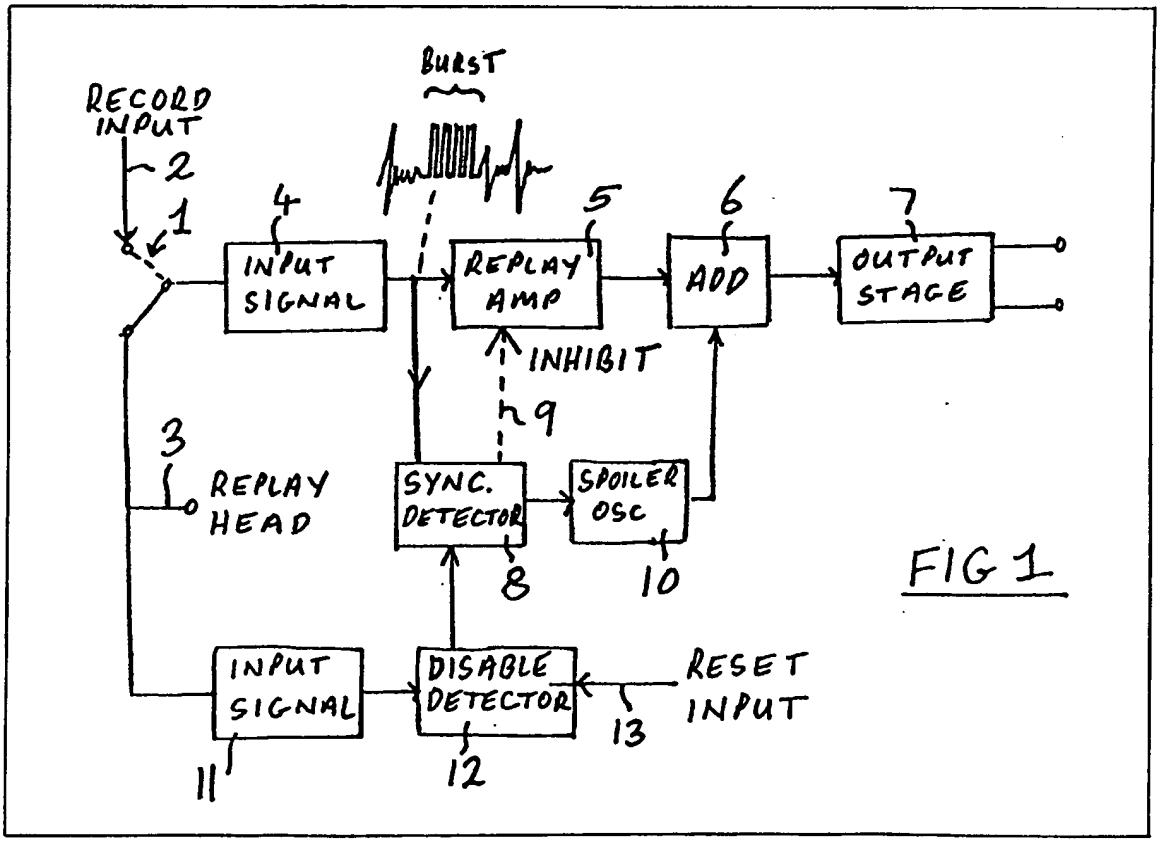

FIG 1

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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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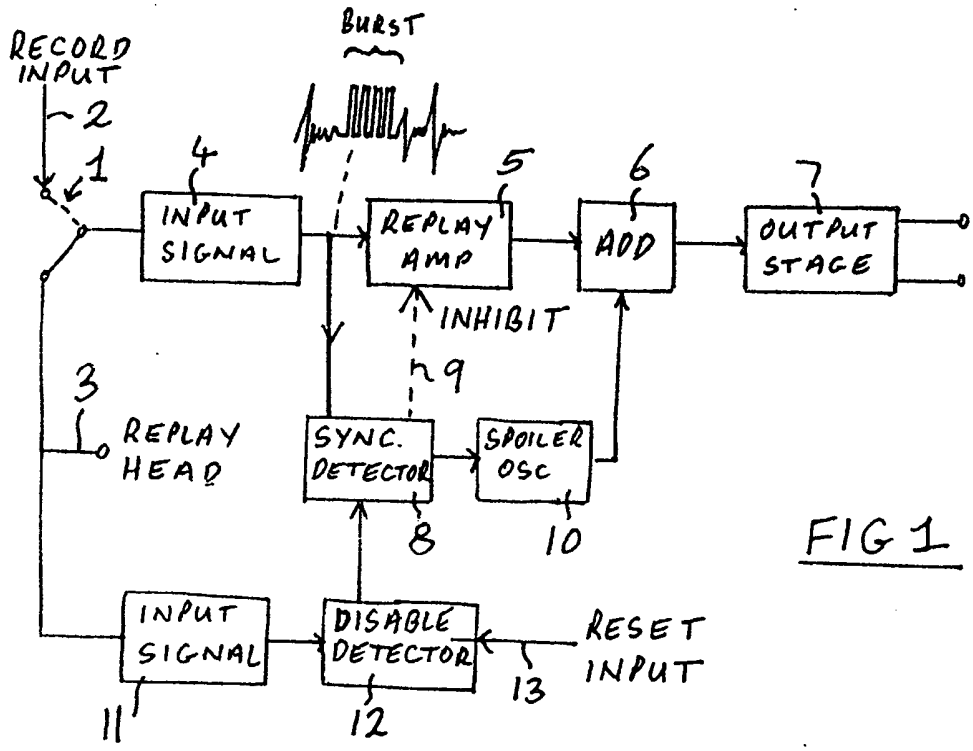

FIG 1

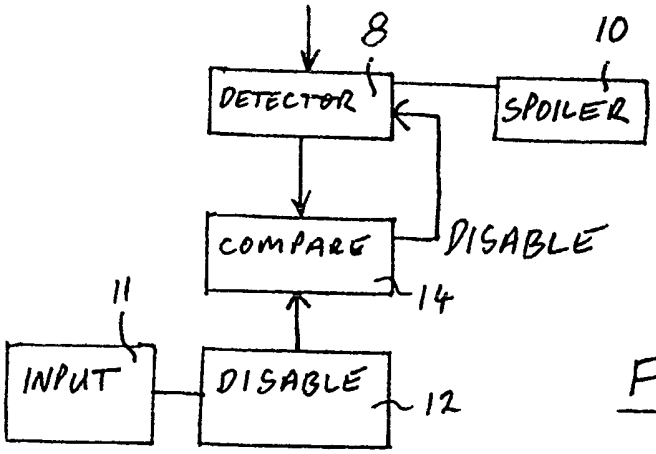

FIG 2

SPECIFICATION

Preventing unauthorised recording from source material

This invention relates to the prevention of unauthorised recording or re-recording of "source material" comprising, as example off-air radio or television broadcasts or recorded material such as audio gramophone records, tape recordings or video recordings in tape or disc form.

An object of this invention is to provide a means whereby a recording machine is inhibited or produces a "marred" recording or playback signal when an attempt is made to produce an unauthorised recording but which can nevertheless be used in a normal manner for other recording purposes.

Broadly, according to this invention, there is provided an inhibitor means for a recording machine, more particularly a recording machine incorporating such a means for connection in the signal recording or possibly playback path, said means being responsive to a coded signal impressed periodically or possibly continuously on a source material signal to effect inhibition, or marring of the recorded or playback signal.

The means preferably comprises a signal detector circuit in the recording signal path and set to be responsive to a copy prevention signal impressed on the source material signal and serving to either disable the recording or to impose thereon a signal which marrs the recorded tape effectively making same unusable.

Preferably the copy prevention signal (CPS) will of sub or super sonic frequency and may be of digital form preferably a coded pulse sequence to which the inhibitor means is responsive. Advantageously the CPS will be repeated in a random manner on the source material. The inhibitor means will normally be set to an "unarmed" condition on initial switch-on to record (or playback) of the recording machine.

To prevent unauthorised disarming of the inhibitor means same may comprise a portion of an integrated circuit which otherwise is a functional part of the recording circuitry, thus disconnection of the means is not possible in a simple manner.

By making use of a coded CPS provision of a simple filter circuit to remove the CPS prior to recording is difficult and furthermore the inhibitor means may then include a code recognising circuit to permit non-inhibition of certain permitted source material. The coding may be externally entered preferably by a magnetic "licence" card or by using a preprogramed integrated circuit e.g. one including a ROM containing a code.

An alternative arrangement is to provide the non-inhibiting code on a blank tape used for recording the code being read into the inhibitor means to disarm same by making it non-responsive to the CPS containing a defined code. Thus a tape might be purchased enabling only recordings to be made from one source.

The tape may include the code in optical or magnetically recorded form on the leader for example.

By making the CPS of very short duration and outside normal audio range little, if any, degradation of the recording will be apparent. In this invention therefore the CPS is contained on the source material but in a manner not requiring filtering during normal playback thus for practical purposes the source material can be used normally. The arrangement is such that activation of inhibiting means in a recording machine is operated.

Alternatively the CPS may be of very low amplitude and impressed on the source material only during quiet or non-signal passages to prevent masking by the source material signal and to avoid reproduction of a strong signal which may produce cross-modulation and distortion.

For video sources the CPS is conventiently placed in the line flyback period or in the first line proper of the picture information.

In an embodiment the CPS is detected using a digital (matched) filter enabling the required known code to be detected from the source material signal which can be considered as noise. A predefined code is required to be held in the inhibitor means to be matched with the CPS. If certain permitted codes are to be used so as not to inhibit recording then the CPS comprises a first coded standard portion which will operate the inhibitor means and a second non standard or discrete code which cancels the inhibitor assuming same is set to respond to this second code.

Conveniently the inhibitor circuit will also be operative in playback whereby replay of unauthorised recordings may be inhibited. For replay of legitimate recordings the prior mentioned leader coding may be included on the tape to prevent inhibition of the playback mode.

In the aforementioned arrangement therefore recordings made from source material on recording machines not having the inhibitor means will still include the CPS preventing playback on recording means with the inhibitor means installed.

An embodiment and modification thereof is shown by way of example in the accompanying schematic two Figures of drawing.

Referring to Figure 1 of the drawings an embodiment is shown for an audio tape recording machine comprising a record replay selector switch 1 to connect either the record input line 2 or playback head 3 to an input signal amplifier 4. The amplifier output feeds a buffer amplifier 5 which passes the signal through a mixer 6 to the output stage 7 feeding either the record head or audio amplifier.

The input amplifier 4 also feeds a detector means 8 which is responsive to a certain discrete signal which may be present in the input signal. The detector may comprise a very narrow bandwidth selective filter, a synchronous detector to operate on phase coherence between the discrete signal and a reference or a digital filter.

The discrete signal can be a burst of set frequency and this may form a digital, e.g. 8 bit code word.

The detector 8 when activated may simply inhibit the amplifier 5 (line 9) or preferably activates a spoiler oscillator 10 which adds a signal to the input through mixer 6. Essential information in the recording can still be heard but the quality is otherwise marred and indentifiable.

It will be apparent that the circuit operates from source material from external inputs as well as from already recorded tape replayed through the machine.

The form of detector/discrete signal used will be selected to have little or no detectable effect on the original material but readily capable detection in a simple manner. A burst signal is preferred this being possibly randomly presented on the input as a periodically repeating signal so that the detector may have a reasonable "failure to respond" rate to one given burst.

Optionally the detector 8 may have a disabling input which can be actuated by a replayed signal amplified through a second input signal path 11 and disabling detector 12. The leader portion of a tape may include a coded recorded signal which is detected by 12. The coded signal may be present on a tape cassette package and read as the cassette is inserted into the machine. This arrangement serves to detect a tape on which, for example, a copyright fee has been paid. The disable is preferably reset at 13 when the recorded is put into a stop-mode.

In a further embodiment shown in part in Figure 2 the input 11 feeds the disable detector 12 which offers the coded signal to a comparator 14. The detector normally enables the spoiler 10 but if a second coded portion is included in the burst signal this can be compared with the coded signal and if the codes agree the detector is disabled. Thus tape may be coded to record only certain source material.

By using a coded burst response to transient passages in a signal is much reduced, preventing marring of otherwise permitted recordings. Further disabling by filtering of the burst signal is difficult. The burst signal will preferably be at the extreme upper end of the frequency response and will be full amplitude recorded. The burst will be of short duration.

The circuitry comprising units 4, 5, 6, 8, 10 and 12, if used will preferably be integrated into a single circuit to prevent tampering.

Broadly, therefore, the invention comprises putting onto a source signal, for example a gramophone recording, a coded signal and including in a tape recorded a detector circuit to mar or inhibit recording only of that signal, the signal being such that it does not significantly detract from the source material quality when played through normal equipment.

In a further embodiment the source material includes a burst signal impressed thereon only when the signal is at or near a no-signal level. The detector becomes operative during such no-signal condition to look for the burst which thereafter enables the spoiler oscillator. The burst signal could be of a low level in such a case there being a phase synchronisable associated with the detector to identify the burst from noise, and lock to the frequency thereof to enable the burst or a following signal to be decoded.

Alternatively, or additionally, the coded burst signal can be superimposed on a part of the source material having high amplitude such as a percussive passage, which predominantly will be "noise" and thus not detectably distorted by impression of a further signal part thereon.

CLAIMS

1. Method for the prevention of unauthorised copying by recording of source material, the method comprising:—

a) impressing onto the source material signal a discrete signal which is not significantly discernable during the normal use of the source material,

b) providing a recording apparatus with detector means integrated with the normal recording circuit of the apparatus and responsive only to said discrete signal to inhibit or spoil the recorded signal.

2. Method in accordance with Claim 1, wherein the discrete signal is digital.

3. Method in accordance with Claim 1 or 2, wherein the source material comprises an audio signal, the discrete signal being present with the audio signal but impressed thereon in a manner which is inaudible.

4. Method in accordance with any preceding claim, wherein the detector means is operative to continuously monitor the signal being recorded and is responsive to the discrete signal when present.

5. A recording machine for use in the method of any preceding claim and including an inhibitor means connected in the signal recording or possibly playback path, said means being responsive to a coded signal impressed periodically or possibly continuously on a source material signal to effect inhibition, or marring of the recorded or playback signal.

6. A recording machine according to Claim 5, wherein the inhibitor means comprises a signal detector circuit in the recording signal path and set to be responsive to a copy prevention signal impressed on the source material signal and serving to either disable the recording or to impose thereon a signal which marrs the recorded tape effectively making same unusable.

7. A recording machine according to Claim 6, wherein the copy prevention signal (CPS) is of sub or super sonic frequency and may be of digital form preferably a coded pulse sequence to which the inhibitor means is responsive.

8. A recording machine according to any preceding Claim 5 to 7, wherein the CPS is repeated in a random manner on the source material.

9. A recording machine according to any preceding claim, wherein the inhibitor means

comprises a portion of an integrated circuit which is otherwise a functional part of the recording circuitry.

10. A recording machine according to any preceding claim, wherein the inhibitor means includes a code recognising circuit to permit non-inhibition of certain permitted source material.

11. A recording machine according to any preceding claim, wherein the CPS is detected using a digital (matched) filter enabling the required known code to be detected from the source material signal.

12. A recording machine in accordance with any preceding claim, wherein the inhibit means is activated during passages or the source material having a predetermined amplitude level to look for the coded signal.

13. A method for preventing unauthorised recording substantially as herein described and exemplified.

14. A recording machine constructed and arranged to function substantially as herein described and with reference to the accompanying drawings.

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